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OF THE AIR FORCE**

AIR FORCE INSTRUCTION 14-205

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Intelligence

***GEOSPATIAL INFORMATION
AND SERVICES (GI&S)***

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This instruction implements the Geospatial Information & Services (GI&S) subset of Geospatial Intelligence (GEOINT) as defined in Title 10 U.S. Code 467. In addition, this instruction implements Air Force Policy Directive (AFPD) 14-1, *Intelligence, Surveillance, Reconnaissance (ISR) Planning Resources and Operations*, 2 April 2004. It provides procedures for identifying functional and area requirements for GI&S as well as the provision and use of GI&S data and products. This instruction also implements AFI 10-301, *Responsibilities of Air Reserve Component (ARC) Forces*, 16 Aug 2006, to ensure provision of GI&S support to all gained Air reserve Components (ARC) Air National Guard (ANG) and USAF Reserve; Department of Defense (DoD) Instruction 5000.56, *Programming Unique Mapping, Charting and Geodesy (MC&G) Requirements for Developing Systems*, 11 September 1991; DoD Instruction 5030.59, *National Geospatial-Intelligence Agency (NGA) LIMITED DISTRIBUTION Geospatial Intelligence*, 7 Dec 2006; DoD Directive 5105.60, *National Geospatial-Intelligence Agency (NGA)*, 29 July 2009; Chairman Joint Chiefs of Staff Instruction (CJCSI) 3901.01B, *Requirements for Geospatial Information & Services*, 15 Jul 2004; CJCSI 3900.01C, *Position (Point and Area) Reference Procedures*, 30 June 2007. The AFI serves the standardization of requirements under AFI 63-101, *Acquisition and Sustainment Life Cycle Management*, 17 April 2009, and AFI 14-111, *Intelligence in Force Modernization*, 10 Jan 2005, as applicable to developing systems requiring GI&S. The term GI&S, formerly known as Mapping, Charting and Geodesy (MC&G), continues to include orthorectified imagery based geospatial products, [e.g. Controlled Image Base, (CIB®)], but not imagery intelligence and other intelligence. The Air Force GI&S discipline is addressed in this instruction. GEOINT and other GEOINT components are addressed separately. GEOINT will be the subject of a forthcoming AFI. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-363, *Management of Records*, and disposed of in

accordance with the Air Force Records Disposition Schedule (RDS) located at <https://www.my.af.mil/afirms/afirms/afirms/rims.cfm>

Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF IMT 847, *Recommendation for Change of Publication*; route AF IMT 847s from the field through the appropriate functional's chain of command. Field activities must send implementing publications to the higher headquarters functional OPR for review and coordination before publishing.

SUMMARY OF CHANGES

This document is substantially revised and must be completely reviewed

This AFI incorporates changes resulting from reorganization and implementation of a capabilities-based A-Staff structure for Deputy Chief of Staff for Intelligence, Surveillance and Reconnaissance, HAF/A2 and the tasking of the Air Force Intelligence, Surveillance and Reconnaissance Agency (AFISRA) with the integration of USAF GEOINT capabilities into the National System for Geospatial Intelligence (NSG), the deactivation of the Air Force Command, Control, Intelligence, Surveillance & Reconnaissance Center (AFC2ISRC), as well as the change of the ACC Combat Targeting and Intelligence Group (CTIG) to the Air Force Targeting Center (AFTC). It reflects the organization of a Geospatial Community of Interest (COI). It cross-references a specific checklist for the proper application and standardization of GI&S requirements to developing systems. It prescribes a waiver system to ensure use of standard products data and tools, and procedures to gain approval for substitute products if standard products are not available. This instruction provides revised and expanded guidance on GI&S functional requirements analysis, documentation and validation in the system development process; driven by integration with AFI 14-111, *Intelligence in Force Modernization*, and recent changes in intelligence roles, responsibilities and activities in the recently revised AFI 63-101, *Acquisition and Life Cycle Sustainment Management*. In overall terms, the revision establishes closer rapport with targeting and other primary users of GI&S, as well as all end users regardless of command. This instruction does not provide authoritative guidance on the following because they are not within AF/A2CG functional purview: DoD Flight Information Publications (FLIP), Digital Aeronautical Flight Information File (DAFIF), and other materials for which Air Force Flight Standards Agency (AFFSA) has functional responsibility; or Evasion Charts for which Joint Personnel Recovery Activity (JPRA) is responsible, and the USAF Installation GI&S (IGI&S) program, formerly known as GeoBase, for which AF/A7C has policy authority. This AFI supersedes AFI 14-205, *Geospatial Information and Services*, (GI&S), 4 May 2004.

Section A—GI&S Responsibilities.

1. National Geospatial-Intelligence Agency (NGA). DoD Directive 5105.60 establishes the Director, NGA as the DoD GEOINT Manager with authority to provide GEOINT functional guidance to the NSG. This is further articulated in *NSG Directive FM 1100 Roles and Responsibilities of the Functional Manager of the National System for Geospatial Intelligence (NSG) and the Establishment of the NSG*. More information on NGA is located on their home pages at: NGA Internet Homepage: <http://www.nga.mil/> SIPRNET: <http://www.nga.smil.mil/> JWICS: <http://www.nga.ic.gov/> and; *NGA Geospatial Intelligence (GEOINT) Basic Doctrine, Publication 1-0, September 2006*.

2. HQ USAF/A2, Deputy Chief of Staff, Intelligence, Surveillance, and Reconnaissance. AF/A2 is the Air Force GEOINT Functional Manager (FM) and designates the Air Force Intelligence, Surveillance and Reconnaissance Capabilities Directorate, GEOINT Capabilities Division, AF/A2CG, as the Air Force GI&S FM. The AF/A2CG GI&S FM validates all GI&S requirements as identified in this instruction to ensure Air Force coordinated GI&S requirements are pursued through technical and funding channels when they cannot immediately be made available by NGA.

2.1. AF/A2CG. As the Air Force GI&S FM, AF/A2CG is the focal point for Air Force geospatial policy planning and provides top level guidance to the Air Force geospatial enterprise consisting of AFISRA, the Air Force GEOINT Office (AFGO) and HQ ACC/A2 geospatial components. AF/A2CG is responsible to organize, train and equip Air Force personnel in the GI&S function. AF/A2CG is the primary Air Force interface with NGA, the Combatant Commands, Under Secretary of Defense for Intelligence, (USD(I)) and the other services on all GI&S matters of policy.

2.1.1. AF/A2CG maintains overall validation authority for all Air Force GI&S functional and CONUS area requirements. AF/A2CG is the focal point for all Air Staff, Major Command (MAJCOM), Field Operating Agency (FOA) and Direct Reporting Unit (DRU) customers needing routine assistance in any GI&S discipline. As part of AF/A2CG, the Targeting Branch is the USAF FM for Air Force targeting and is a major focus for geospatial data and activity application. GI&S generally serves as the foundation of targeting operations. AFI 14-117, Air Force Targeting, 13 May 2009, lists the responsibilities of the Targeting FM.

2.1.2. AF/A2CG will chair the Air Force Geospatial Community of Interest (COI), to facilitate the exchange of information and to increase quality of geospatial processes and levels of proficiency. The COI will identify data, create a shared understanding and eliminate duplicative data. In addition to the COI, AF/A2CG will establish a Community of Practice (COP) web page in the Air Force Knowledge Now (AFKN) to post products, general information, minutes and related geospatial information for the widest Air Force dissemination. MAJCOM/FOA/DRU and other subordinates are encouraged to produce and maintain a COI web site for MAJCOM level portrayal of geospatial information. The purpose of this site is to provide information for all command users of GI&S to better understand related doctrine, directives, procedures and provide a general background concerning the GI&S functional area. A major aspect of these pages will be the many links that will permit the user to gather information at a greater depth if so desired. In addition, these web pages will provide a link to a number of GI&S

requirement areas for examination of existing requirements and formulation of new requirements.

<https://afkm.wpafb.af.mil/ASPs/CoP/OpenCoP.asp?Filter=OO-IN-AF-11>

2.2. AF/A2R. The ISR Resources organization represents AF/A2 at the DoD level for the development, coordination and implementation of fiscal and information support plans and programs. AF/A2C advises AF/A2R concerning plans, programs, resources, support initiatives, and technical advancements that affect GI&S.

2.3. AF/A2D. The Director for ISR Strategy, Integration & Doctrine is responsible for GI&S personnel resource utilization and training issues.

2.4. AF/A2Q. The Director for ISR Innovations & Unmanned Aircraft System (UAS) Task Force is responsible for the Innovation Program which includes use of imagery and mission planning data to facilitate selected operations. AF/A2Q shall provide close coordination and support to AF/A2CG concerning lessons learned from operational uses of geospatial data in crisis situations.

2.5. AF/A7C. This organization is responsible for GI&S support for the installation and facilities mission known as the IGI&S Program. The IGI&S Program is implemented at each USAF installation and echelon through a corresponding Geo Integration Office (GIO). IGI&S ensures the provision of and access to common, accurate and current geospatial information for all Air Force installations, ranges and property. Geospatial services are the combination of Information Technology (IT) infrastructure, services, and architectures that enable access to geospatial information. AFI 32-10112, *Installation Geospatial Information and Services*, (Installation GI&S), 19 Oct 2007, is the applicable instruction.

3. Air Force Intelligence, Surveillance, and Reconnaissance Agency (AFISRA). Air Force Intelligence, Surveillance and Reconnaissance Agency as the Air Force GEOINT Element (AFGE) is the lead agency for integrating Air Force GEOINT capabilities into the NSG. The AFGE following AF/A2CG policy guidance will ensure Air Force GEOINT assets are properly integrated and tailored to fit within the NSG resulting in maximum Air Force mission effectiveness. The AFGE implements HQ USAF policy on all Air Force GI&S planning, training, equipping, programming, and budgeting matters.

4. Air Combat Command (ACC), Air Force Targeting Center (AFTC). Assigned to ACC, the AFTC produces and delivers timely, tailored targeting and geospatial intelligence, combat identification products, strategic analysis, and unit support enabling the full spectrum of military operations. It is comprised of three active duty units (15 Intelligence Squadron (IS), 20 IS and 36 IS) with additional Air Force Reserve and Air National Guard forces providing combat capability. The AFTC conducts the Air Force precise Point Positioning certification and training program; produces Controlled Imagery Base (CIB) products; and maintains and distributes the Geospatial-Intelligence Product Library (GPL) for HQ USAF. The AFTC meets operational requirements by producing tailored intelligence fused from all-source data and made available on-line or delivered in the most expedient manner to ensure on-time delivery.

5. HQ Air Force Flight Standards Agency (AFFSA.) As outlined in AFI 11-201, *Flight Information Publication*, 31 March 09, the Aeronautical Information Branch (HQ AFFSA/A3IF) investigates, defines, consolidates, assembles, validates and lists, in order of priority, Air Force operational requirements for Flight Information Publications (FLIP), Digital Aeronautical Flight

Information File (DAFIF), and related aeronautical information. AFFSA/A3IF is the Air Force point of contact with NGA on FLIP and DAFIF matters to include nonprocedural discrepancies. AFFSA/A3IF is also the point of contact to the Federal Aviation Administration (FAA), National Aeronautical Charting Office, (NACO) for NACO aeronautical products.

6. HQ Air Force Materiel Command (AFMC/A2). HQ AFMC/A2 and subordinate organizations analyze weapon system performance requirements, Tactics, Techniques and Procedures, Concepts of Employment, threat environments and existing and planned GI&S technology for the purpose of designing and developing the most appropriate GI&S solutions for weapon systems and Automated Information Systems (AIS), in basic development or undergoing block or spiral upgrades. These solutions will address, but are not limited to, data requirements, data storage requirements, training requirements, facilities, and funding requirements. HQ AFMC/A2O/X, ISR Operations, responsibilities center upon those requirements that relate to weapon system research, development, modification, test and sustainment operations within the AFMC management structure. AF Space Command (AFSPC) has oversight and support of space programs outside of AFMC management. However, because AFMC programs are the biggest users of GI&S, AFMC will have central management for obtaining GI&S for all AF programs.

6.1. Assures Air Force Joint Capabilities Integration and Development System (JCIDS) documents reflect potential GI&S requirements as prescribed by this AFI and CL-1, CJCSI 3312.01A, *Joint Military Intelligence Requirements Certification*, AFI 14-111, *Intelligence in Force Modernization*, AFI 63-101, *Acquisition and Life Cycle Sustainment Management*, AFI 10-601, *Mission Needs and Operational Requirements Guidance and Procedures*, and local command GI&S requirements guidance. The final validation action for all GI&S requirements rests with AF/A2CG. AF/A2CG will undertake any policy level coordination as may be required with NGA. Non policy level coordination by AFMC/A2O/X with NGA and any command NGA Liaison Officer is encouraged.

6.2. The AFMC/A2O/X GI&S role is to ensure comprehensive analysis and documentation of GI&S functional requirements and provision of GI&S support to research, development, test and sustainment activities under AFMC management; executed in conformance with AFI 14-205, CL-1, and command procedures. AFMC/A2O/X is also responsible for managing and directing command GI&S system-of-systems analysis to minimize system-specific, stove-piped GI&S solutions for the Air Force weapon system portfolio. AFMC/A2O/X will manage and direct the development and sustainment of an on-line database to track functional GI&S requirements of weapon systems under AFMC management. GI&S requirements identified through AFMC processes will be managed by AFMC/A2O/X or their subordinate offices and not directly by NGA personnel. AFMC will submit area requirements IAW paragraph 8.2. and participate in requirements calls as necessary.

6.3. The AFMC Intelligence Squadron will maintain a database of GI&S functional requirements and shortfalls for all Air Force research, development, test and sustainment programs and projects. The database will maintain sufficient information to support development and execution of the AF GI&S strategy development; to include research proposals, budgeting and planning activities supporting current and future GI&S dependent technologies. It will enable users to understand potential operational impacts caused by transitioning to future NGA data, format and programs in a changing all-digital GI&S environment. This living database will be kept current as new systems enter the preliminary

planning phases and legacy systems are retired. Any required releasability caveats will be maintained and followed.

6.4. The AFMC intelligence community is periodically involved in Foreign Military Sales (FMS) programs. These programs are of high importance to US-Allied cooperation. Because each case is based on a wide variety of circumstances, each must be negotiated by NGA through AF/A2CG.

6.4.1. AFMC/A2O/X and/or subordinate AFMC organizations will request release of NGA products to FMS programs by memorandum to AF/A2CG, a minimum of 90 days prior to need. The memorandum will contain, at a minimum, the following information elements: (1) FMS Program name, (2) FMS program contract number, (3) Receiving country, (4) NGA products required (series, stock numbers), (5) Intended product usage, (6) Date products required, (7) Impact if products are not released, and (8) Date products are required. The memorandum will be coordinated with the AFMC NGA liaison prior to submission.

7. Air Force Components of Combatant Commands, MAJCOMs, FOAs, DRUs. Commanders of these organizations will establish a GI&S Point of Contact (POC). The GI&S POC will consist of personnel trained sufficiently to conduct the assigned responsibilities of this paragraph. AF/A2CG is endeavoring to increase the understanding of the geospatial function and the need to further integrate GI&S with the other GEOINT and targeting functions. Failure to have a basic foundation of GI&S understanding among key personnel can impact operations and degrade mission effectiveness. The USAF GI&S Smart Book, available on the Geospatial Community of Interest (COI), <https://afkm.wpafb.af.mil/ASPs/CoP/OpenCoP.asp?Filter=OO-IN-AF-11> is a supporting tool to the GI&S function. The GI&S Smart Book contains instructions to obtain Computer Based Training disks. Completion of this training should be considered as a minimum if other courses cannot be taken in residence. In addition, AF/A2CG has published AFI 14-205, Checklist 1, as mandatory for implementation of GI&S requirements. Use of the Smart Book and AFI 14-205, Checklist 1, will help fill the void of not having experienced GI&S personnel. Each organization will:

7.1. If required by parent command, issue supplemental instructions to this instruction within six months of its publication. Implementing publications will be forwarded to the higher headquarters functional OPR for review and coordination before publishing.

7.2. Each organization will supply the name of a POC to AF/A2CG, and AFMC/A2O, to receive emails for alerts or tasking in reference to GI&S requirements management. This POC will be responsible for coordination of responses from the organizations. This POC can be additional to the primary GI&S POC according to command needs.

7.3. Ensure GI&S points of contact establish and maintain GI&S distribution accounts and submit routine and Automatic Distribution (AD) requests to Defense Logistics Agency, as necessary. Manage all life-cycle needs of the Geospatial Product Library-Air Force (GPL-AF) to ensure readiness of latest data and products.

7.4. As required, prepare GI&S Annexes (Annex M) to Combatant Command Operation Plans (OPLANs) and Concept Plans (CONPLANs) according to AFMAN 10-401, *Operation Plan and Concept Plan Development and Implementation*, 1 May 1998, and supported

command directives. Ensure dissemination of digital materials via the GPL-AF supersede and replace traditional bulk hardcopy materials currently in War Reserve Stock (WRS). Remember, hard copy charts from WRS will not have Chart Updating Manual (CHUM) updates unless the updates are manually plotted or the chart is created using a system that applies the updates.

7.4.1. Identify, request and maintain on GPL-AF, appropriate GI&S stocks/data to support Combatant Command OPLAN, or CONPLAN tasking.

7.4.2. Conduct War Reserve Stocks (WRS) planning. The criticality of traditional WRS planning is decreasing because of increased use of digital data on GPL-AF. However, the following still applies to Combatant Commands WRS planning. Where applicable, identify WRS requirements for movement in the Time Phased Force Deployment Documentation Listing (TPFDDL) and the OPLAN or CONPLAN Logistics Annex. Use AFMAN 10-401 when developing and reviewing Annex M to OPLAN, CONPLAN. AFMAN 10-401 provides air components preparing plans for an OPLAN with guidance, formats and procedures consistent with the Joint Operation Planning and Execution System. AFMAN 10-401 also guides MAJCOMs when preparing plans to support Air Force unilateral plans. Generic procedures for estimating WRS quantities are available from the Geospatial COI: <https://afkm.wpafb.af.mil/ASPs/CoP/OpenCoP.asp?Filter=OO-IN-AF-11>. If GPL-AF and reproduction resources exist, reduce WRS quantities to reconciled MAJCOM required levels. Quantities should diminish as GPL-AF and reproduction resources continue to increase.

7.5. Establish procedures to ensure sufficient GI&S items are available to sustain routine operations and ensure adequate re-supply. Issue maps, charts, digital GI&S data and related items when required. Maintain accessibility to pertinent NGA instructions, manuals and catalogs.

7.6. Actively coordinate with command operations, plans, training, logistics, requirements, inspection, and intelligence staffs to ensure doctrine, strategy, tactics, logistics, and Research, Development, Test, and Evaluation (RDT&E) efforts adequately address GI&S functional requirements.

7.7. Assist in the origination and fielding of new procedures and techniques to facilitate Air Force generated changes such as the GPL-AF development.

7.8. Ensure GI&S programs are funded as applicable.

7.9. Ensure data/product reviews are accomplished and responses to all NGA GI&S product reviews are routed through the chain of command to AF/A2CG for Air Force position.

7.10. Participate in annual Air Force GEOINT conferences, periodic special GI&S meetings and the Air Force GI&S COI, to address critical GI&S matters of mutual concern.

7.11. Ensure subordinate units are aware of, and comply with Air Force and Joint Chiefs of Staff (JCS) policy regarding use of World Geodetic System (WGS) and other datums as prescribed in CL-1, relating to this instruction. All organizations will use the most current WGS84 for all GI&S support to operations, unless otherwise directed by the cognizant joint

combat commander, and will only use NGA validated software for datum transformations. This is an item for inspection.

7.12. Provide GI&S support to all gained Air Reserve Components (ARC) [Air National Guard (ANG) and USAF Reserve] IAW AFI 10-301, Responsibilities of Air Reserve Component (ARC) Forces, 16 August 2006.

7.13. Coordinate GPL-AF installation, maintenance and information requests with HQ ACC/A2YS, and AF/A2CG.

Section B—Identifying Requirements for Geospatial Information.

8. GI&S Requirements Flow and Definitions: There are three major classes of GI&S requirements. The NSG Needs List, Area Requirements and Functional Requirements for developing systems and operational capabilities. MAJCOMs, FOAs, and DRUs will identify new geospatial capability needs in the NSG Needs List. These requirements will be prioritized and validated by AF/A2CG. Area Requirements are requests for production of standard NGA products and data over specific geographic areas. Functional Requirements, managed by HQ AFMC/A2O/X, are for existing, modified and new GI&S information in support of Air Force research, development, test and sustainment activities under AFMC management. CJCSI 3901.01B and AFMAN 10-401 prescribe GI&S functional and area requirements identification processes for DoD. AFI 14-111, prescribes the integration of intelligence into the Air Force's modernization processes. Air Force CL-1 related to AFI 14-205, and AFMC guidance provides the means for writing new GI&S requirements or checking the validity of existing requirements. AF/A2CG maintains validation authority and authority to negotiate policy between Air Force and NGA.

8.1. Functional GI&S requirements originate in the system development community as an output of AFMC systems engineering-level analysis conducted on combat system performance requirements provided by the operational community. These requirements serve as the foundation for developing and maintaining the appropriate GI&S materials and support to the entire weapon system life cycle, starting with developmental planning through weapon system retirement, using relationships identified in Section A. New functional requirements are forwarded from the identifying AFMC intelligence office (or AFSPC intelligence office for space programs) through AFMC/A2O/X to AF/A2CG. AF/A2CG validates and forwards all fully processed functional requirements to NGA for adoption, development and production. Some of these requirements and those of the NSG Needs List are coordinated for adoption by other services to increase interoperability.

8.2. Area requirements are requests for standard products and data over specific geographic areas. AF/A2CG will manage the Air Force area requirements process for CONUS training areas including Alaska. COCOMS manage area requirements for operational areas in OCONUS.

8.3. System-level requirements are those GI&S requirements derived from engineering-level analysis of combat performance requirements conducted in collaboration with Program Offices. They represent the translation of specified operational capabilities into specifications for software, hardware, data and all components that comprise the finished system.

8.4. AFMC/A2O/X, and Program Development Offices coordinate new or modified systems' GI&S data needs to ensure interoperability and compatibility of NGA and other GI&S data sources. It is of utmost importance that this be done as early as possible in the development cycle.

8.5. All computer software designed to use GI&S data must use NGA authorized data, information, and NGA or AF/A2CG certified formats to the extent possible without intervening transformations. The goal is to eliminate need for transformations that can impact interoperability, and data fidelity or incur unnecessary developmental or operational costs. The use of unauthorized proprietary formats is strictly prohibited and an area of concern for inspection.

8.6. Feature data in support of Feature Based Operations (FBO) falls under the NGA Topographic Feature Data Management (TFDM) program to provide feature data at various resolution levels, designed to support specific missions. AF/A2CG will identify feature requirements for transmission to NGA ensuring future aeronautical data is available to fulfill all Air Force mission needs.

8.7. Identifying Personnel Training Requirements. NGA's National Geospatial-Intelligence College (NGIC) provides both basic and advanced, specialized GI&S training. Organizations at all levels having key GI&S positions will ensure incumbents have or receive the formal NGIC training needed to perform assigned responsibilities. The 17th Training Wing, Goodfellow AFB, TX, provides broad GI&S training as needed to supplement intelligence skills courses.

8.8. Functional requirements programs will be managed to the maximum extent possible using web-based requirements tools. These tools should provide an edit-change capability of GI&S requirement categories, and enable review of existing requirements or formulation of new requirements. The tools should also have tracking capabilities and require the user to have an approved account to access the tool.

9. Air Force Geospatial Programs

9.1. Geopositioning and Common Geopositioning Services (CGS). AF/A2CG serves as the FM for Air Force targeting IAW AFI 14-117. AF/A2DF, Force Management and Readiness Division oversees development of USAF intelligence programs IAW NGA certification standards for precise point positioning training and certification. AF/A2DF, coordinates with AF/A2CG on matters requiring target coordinate mensuration expertise. HQ ACC/A2 acts as the lead MAJCOM for matters related to training and certification of personnel performing target coordinate mensuration. The Air Force Targeting Center has responsibility under HQ ACC/A2. AF/A2CG will work with the MAJCOMS to transition new technologies that satisfy operational geopositioning requirements.

9.2. Geospatial Product Library Air Force (GPL-AF). HQ ACC/A2YS has responsibility for management of the GPL-AF. See HQ ACC COI for a detailed program description: <https://afkm.wpafb.af.mil/ASPs/CoP/OpenCoP.asp?Filter=AC-IN-00-07> The Air Force Targeting Center maintains and disseminates GPL-AF products to Air Force units. The GPL-AF is a product server designed to store and disseminate GI&S data for use at all Air Force levels. HQ ACC/A2YS develops GPL-AF modernization strategies to meet Air Force

data storage and data distribution requirements, and ensures all GPL-AF functions are compatible with current and future Air Force systems.

9.3. AF/A2CG will provide specific requirements management of Government-Off-the-Shelf/Commercial-Off-the-Shelf (GOTS/COTS) software packages being considered for standard use by Air Force C4ISR organizations and systems. GIS software packages are the primary means to manipulate standard NGA authorized information. AF/A2CG will provide Air Force representation to the NGA MCG&I ESG and be the focus of related requirement collection for Air Force. NGA Instruction 8400.1R7, 29 Jan 07, covers acquisition of information technology products and software validation. The NGA certification ensures both COTS and GOTS meet accuracy requirements when used with NGA products, data or adopted standards. This certification is the formal acknowledgement of acceptability. AFI 33-114, *Software Management*, identifies overall responsibilities for management of COTS and GOTS.

Section C—Obtaining Geospatial Information

10. GI&S Products.

10.1. Data Access. Air Force GPL (GPL-AF) is the main source for NGA standard digital GI&S data. GPL-AF's are deployed to the MAJCOM and squadron level. The master GPL-AF contains worldwide geospatial product coverage (maps, charts, elevation data, and imagery based geospatial products such as CIB), and is maintained at AFTC, Langley AFB, VA. When digital products are not available from GPL-AF, customers can obtain existing NGA products for standard and crisis or contingency support using sources or procedures listed below.

10.1.1. The NGA Gateway and Softcopy Distribution facility provides additional means for on-line product distribution, and some software tools for manipulation of products and data.

10.1.2. Defense Logistics Agency (DLA), NGA Catalogs of Maps, Charts and Related Products provide guidance for ordering standard NGA products available from DLA.

10.1.3. In areas where standard NGA products are not produced or available through normal channels, identify requirements for substitute, non-standard products through the supported command's GI&S chain of command as appropriate.

10.1.4. Special attention is required regarding distribution caveats. NGA uses a "LIMITED DISTRIBUTION" marking to indicate that distribution of certain unclassified imagery and geospatial information is limited to DoD and authorized DoD contractors in accordance with the Defense Federal Acquisition Regulations Supplement. Air Force organizations at all levels having responsibilities to produce or disseminate LIMITED DISTRIBUTION NGA data, must ensure this data remains in official channels prescribed by DODD 5030.59.

10.1.5. Air Force GI&S Ordering Guidance. When products are not available via the GPL, use the latest versions of the following publications or web sites for guidance on ordering and stocking GI&S products.

10.1.5.1. NGA, DLA Catalogs of Maps, Charts and Related Products, all volumes.

10.1.5.2. AFMAN 10-401, Operation Plan and Concept Plan Development Implementation.

10.1.5.3. AFI 11-201, Instruction for Flight Information Publications (FLIP).

10.1.5.4. AFI 11-230, Instrument Procedures.

10.1.5.5. Defense Logistics Agency Internet Homepage (<http://www.dla.mil/>)

10.1.5.6. Defense Supply Center Richmond Internet Homepage (<http://www.dscr.dla.mil/>)

10.1.5.7. NGA Gateway, www.nga.mil (NIPRNet server), osis.nima.mil (SBU/OSIS Server), www.nga.smil.mil (SIPRNet Server), www.nga.ic.gov (JWICS Server). Intelink-U, <https://www.intelink.gov/nga> (NIPRNet server)

10.2. Obtaining Precise Points

10.2.1. Units having geopositioning software capability and associated Digital Point Positioning Data Base (DPPDB) can perform geopositioning IAW para. 2.3.2.1. AFI 14-117, 13 May 2009. Identify new DPPDB coverage needs IAW Section B, this AFI. DPPDB should be the preferred source for precise point generation. If DPPDB alone cannot be used, users employing imagery registration techniques should use source, in the following order: National Technical Means, commercial, tactical or other mission imagery tied to DPPDB.

10.2.2. In areas where no DPPDB coverage exists, or where point requirements exceed local geopositioning capabilities, units can obtain geopositioning support from the AFTC or NGA. Information concerning NGA's program can be found on the SIPRNet at: <http://sps.stl.nima.smil.mil/products/nimapoints/index.html>. Information concerning AFTC products can be found on the SIPRNet at: <http://ctig.langley.af.smil.mil>. Each year AF/A2CG tasks the MAJCOMs, FOAs and DRUs to estimate their 6-month to 1-year points requirements and geopositioning priorities. The resultant level-of-effort estimates are forwarded to NGA, in a consolidated Air Force requirement. Throughout the year, as geopositioning data is needed for individual points, users will send requests directly via electronic means to "NGA ST LOUIS AFS MO//PRTC//." Commercial: (314) 676-5764 or DSN: 693-5764. Include: accuracy required in feet/meters for Circular Error and Linear Error values, imagery, with a description of the point desired, required datum (e.g. World Geodetic System), type of coordinates desired (e.g., geographic or Military Grid Reference System (MGRS), IAW CJCSI 3900.01, *Position Reference Procedures*; as well as priority and justification. Coordinate the turn-around time for completing routine requests and include information copies to the appropriate higher command, and the Air Force NGA Support Team.

10.2.3. Crisis Support. Quick response support for geopositioning will be submitted through the responsible Unified Command to the appropriate NGA Support Team. Additionally, the AFTC can provide geopositioning for crisis support. Pre-arrange the turn-around time in number of hours per point according to mission need and NGA or AFTC resource availability.

10.3. Obtaining Geodetic Survey Support. Send requirements for geodetic survey support to AF/A2CG through the responsible MAJCOM, FOA or DRU GI&S POCs. See Geospatial

COI for instructions concerning the format of the Geodetic Support Worksheet and the guide for establishing Geodetic and Geophysical (G&G) accuracy standards for generic surveys: <https://afkm.wpafb.af.mil/ASPs/CoP/OpenCoP.asp?Filter=OO-IN-AF-11>

10.4. GI&S Products for Contractors. Contractors needing standard GI&S product support will submit requests through their program's Primary Contract Officer (PCO). The PCO then forwards requests to the appropriate command GI&S office. Compliance with AFI 31-601, *Industrial Security Program Management*, 29 January 05, is required. System Engineering Technical Assistance (SETA) contractors, with a non-disclosure statement, are exempt from access restrictions pertaining to other contractors. Systems are to use NGA data in standard format with no format or data conversions to any proprietary format. Command GI&S offices will review and validate contractor requests and forward requisitions to the Defense Supply Center Richmond-JN (DSCR-JN).

10.5. System developers under Air Force jurisdiction must coordinate with the AFMC/A2 or their appropriate MAJCOM GI&S office on planned designs, new system development or existing system modifications that call for GI&S data to facilitate and ensure interoperability and compatibility with NGA databases. All computer software that will use NGA data must be directly compatible with the NGA databases and the NGA formats. The goal is to eliminate the need for translations or transformations that may impact NGA data fidelity, interoperability, accuracy and cost.

11. Non-NGA GI&S Products. MAJCOMs, FOAs and DRUs will make every effort to ensure only NGA or AF/A2CG authorized information is used. Therefore, only request non-NGA products or contract production support when AF/A2CG or the appropriate Combatant Command GI&S office confirms the required support cannot be obtained from NGA.

11.1. Requesting non-NGA Products. With the exception of United States Geological Survey (USGS) and Central Intelligence Agency (CIA) products, submit requests for existing GI&S products not produced by NGA or specifically addressed in this instruction (e.g., native edition maps) to the AF/A2CG or the GI&S point of contact of the Combatant Command responsible for the area covered by the products. Specific instructions for ordering non-NGA products, NGA Instructions, Manuals, Catalogs and FLIP products, are covered in the Geospatial COI: <https://afkm.wpafb.af.mil/ASPs/CoP/OpenCoP.asp?Filter=OO-IN-AF-11>

Section D—Using Geospatial Information & Services (GI&S)

12. General. GI&S serves as the foundation for operations and provides basic interoperability for systems and forces. GI&S is critical to operations. Basic understanding of key GI&S fundamentals is necessary to prevent adverse or deadly mission impact through introduction of errors. The following paragraphs highlight principal GI&S areas where detailed understanding and application is paramount.

12.1. Datums, Coordinates and Reference Systems, and World Geodetic System (WGS84). An in-depth understanding of datums is critical to modern operations. WGS84 is the standard DoD reference system (datum) for all DoD GI&S products and services. Where feasible, Air Force organizations will use the most current WGS84 for all activities requiring GI&S data. When necessary to convert to or from WGS84 and local or regional datums, Air

Force organizations will use NGA validated datum transformation software. CJCSI 3900.01C, *Position (Point and Area) Reference Procedures*, 30 Jun 07, requires selection of a standard datum, as prescribed by the Combatant Commander, in areas where operation on WGS84 is not possible. In addition to NGA references below, see Appendix 1 of the USAF GI&S Smart Book for the required critical understanding of Datums, Coordinate Systems and product accuracy. The USAF Smart Book is available on the Geospatial COI: <https://afkm.wpafb.af.mil/ASPs/CoP/OpenCoP.asp?Filter=OO-IN-AF-11>.

12.2. Reference Systems. Coordinate reference systems are the means of communicating locations. It is critical that all joint/combined participants communicate in the same terms. Defense Mapping Agency Technical Manual 8358.1, *Datums, Ellipsoids, Grids, and Grid Reference Systems*, gives current authoritative guidance for the use and portrayal of grids and grid reference systems information as applicable to maps and charts. See: <http://www.nga.mil/GandG/>.

12.3. Vertical Datums. With reference to Height Above Ellipsoid (HAE) and Mean Sea Level (MSL), understand your requirement prior to submission and ensure mensuration needs according to weapon or Automated Information System (AIS) requirements. Ensure conversion of dissimilar vertical datum as necessary.

12.4. Transformations. GEOTRANS or NGA certified transformation algorithms will be used for all transformations related to the three paragraphs above. Errors are induced each time a transformation is made, but use of the NGA approved software will limit the error. Transformation software information is on-line in NGA G&G pages <http://www.nga.mil/GandG/>.

13. Geopositioning and Accuracies. Geopositioning is critical to the employment of Precision Guided Munitions (PGM). Paragraph 9.1 describes the means and methods used to obtain precise points. NGA's DPPDB is currently the only product available to users capable of providing accuracies adequate for coordinate seeking weapons. All Air Force users must use NGA validated software for targeting, unless AF/A2CG authorizes otherwise.

13.1. Coordinates for Targeting and Related Precise Points. Maps, charts and related GI&S data and imagery derived products such as Controlled Image Base (CIB®) are unsuitable for coordinate extraction for precision targeting purposes. Digital Point Positioning Database (DPPDB), IAW AFI 14-117, 13 May, 2009, is the key to generation of all target coordinates and related precise points for navigation and offset aimpoints. If you do not have DPPDB, NGA or AFTC support can be requested through organizational channels.

13.2. Photocopied or reproduced digitized maps and charts. Producing map copies may introduce distortions and errors to the original product. Although making copies may be the most expeditious method for preparing strip charts and mission packages, Air Force discourages using these copies to derive coordinates or measure distances. Mission Planning System (MPS) and Commercial Joint Mapping Tool Kit (CJMTK), negates "Strip Chart" printing distortion concerns because mission planning software and CJMTK route calculations are performed internal to the software; not on potentially distorted paper copies.

13.3. Many commercially produced maps and charts are copyrighted, as are many of the foreign produced maps and charts available through NGA. Users of these products should be aware of any potential copyright infringements.

14. Updating and Disposing of Material. Use the following documents to update aeronautical charts and FLIP before using them. Users are responsible for annotating the corrections to NGA publications or products prior to use.

14.1. NGA Electronic Chart Updating Manual (ECHUM) contains a list of published aeronautical charts by series with a list of known corrections. ECHUM is available on all the Aeronautical web sites:

<https://aero.geointel.nga.mil/products/webchum/index.cfm> (NIPRNet)

<http://aero.geoint.nga.smil.mil/products/webchum/index.cfm> (SIPRNet)

<http://aero.geoint.nga.ic.gov/products/webchum/> (JWICS)

14.1.1. Report changes to FLIP as directed in AFI 11-201 and in FLIP, General Planning. Process changes qualifying as Notice to Airman (NOTAM) material according to AFI 11-230, *Instrument Procedures*. Consult AFFSA/A3IF for guidance.

14.2. Processing Obsolete, Superseded and Excess GI&S Stocks. Dispose of classified maps, charts and related materials as specified in AFI 31-401, *Information Security Program Management*, 1 Nov 05. Dispose of unclassified maps and charts as instructed in the applicable NGA Catalog or from DLA at: http://www.dscr.dla.mil/PC9/G_info/Destruction.htm.

14.3. Units with surplus current GI&S stocks should contact Defense Supply Center Richmond-JN, for disposition instructions.

15. GI&S Software Policy. Users who wish to use GI&S software other than that certified by NGA must contact AF/A2CG. NGA works to assure that testing for certification will be applied to any software exploiting NGA products. This gives assurance software adheres to the standards and accuracy requirements, (See Para 9.3).

16. Participating in NGA and Command GI&S Related Reviews. AF/A2CG tasks MAJCOMs, FOAs and DRUs to participate in periodic NGA product and prototype reviews. In addition, HQ AFMC/A2 organizations monitor developing systems under incremental development techniques, and periodically asks Air Force organizations to evaluate standard and prototype GI&S products and systems requiring GI&S. This activity will be in coordination with AF/A2CG. The purpose is to find out: if existing products still meet user needs; to identify any necessary changes; to determine if requirements still exist; or to determine if new products meet the needs for which they are designed. HQ AFMC/A2X also selects random user groups to test functional aspects of systems under development. HQ AFMC/A2X acts as the technical agent for development activity and consolidates Air Force positions. Air Force component commands tasked by Combatant Commands should also respond through AFMC/A2X so inputs can be reflected in consolidated Air Force positions for AF/A2CG approval.

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Attachment 1

GLOSSARY OF REFERENCE AND SUPPORTING INFORMATION

References

Note: When multiple computer links to single references are given, they are listed in the order of: NIPRNet; SIPRNet; and JWICS.

Title 10 U.S. Code 467

DoD Instruction 5000.56, *Programming Unique Mapping, Charting and Geodesy (MC&G) Requirements for Developing Systems*, 11 September 1991.

DoD Instruction 5030.59, *National Geospatial-Intelligence Agency (NGA) LIMITED DISTRIBUTION Imagery or Geospatial Information and Data*, 7 Dec 2006.

DoD Directive 5105.60, *National Geospatial-Intelligence Agency (NGA)*, 29 July 2009.

MIL-STD-2408, *Mapping, Charting & Geodesy, Glossary of Feature and Attribute Definitions*, 31 March 2004.

MIL-STD-600001, *Mapping Charting and Geodesy Accuracy*, 31 March 2004.

Chairman Joint Chiefs of Staff Instruction (CJCSI) 3505.01A, *target Coordinate Mensuration Certification and Program Accreditation*, 11 March 2009.

Chairman Joint Chiefs of Staff Instruction (CJCSI) 3901.01B, *Requirements for Geospatial Information & Services*, 15 July 2004, (current as of) 22 Aug 2007.

Chairman Joint Chiefs of Staff Instruction (CJCSI) 3900.01C, *Position (Point and Area) Reference Procedures*, 8 July 08.

Joint Pub 2-03, *Geospatial Intelligence Support to Joint Operations*, 22 March 2007.

NGA GEOINT Basic Doctrine, Publication 1.0, September 2006

NGA Reference Materials for Military Support.

http://www.nga.mil/mil/cda/article/0,2311,3104_116913_117196,00.html

NGA Catalog of Maps, Charts and Related Products, Parts 1-7.

<http://www.geoint.nga.ic.gov/publications/catalog.html>

National Geospatial-Intelligence College *Catalog and Course Descriptions*.

http://college.nga.ic.gov/htbin/Td/dbma&/db.cgi?db=Td&uid=default&view_search=1&catreg=on

NGA Instruction 8660.10, *Procedures for Request, Release, Handling and Distribution of NGA MC&G Digital Products*.

http://policy.nga.smil.mil/DR_Main/policyGuidance.cfm#DCIDS

NGA *Geodesy for the Layman*.

<http://164.214.2.59/GandG/pubs.html>

<http://sps.stl.ngaa.smil.mil/products.gandg/index.html>

<http://www.geoint.nga.ic.gov/products/gandg/publications/geolay/toc.html>

NGA Datums, Ellipsoids, Grids and Grid Reference Systems

<http://www.nga.mil/GandG/>

<http://sps.stl.ngaa.smil.mil/products.gandg/index.html>

NGA Instruction 8400.1R7, *NGA Instruction for Acquiring Information Technology Products*, 29 Jan 2007.

AFPD 14-1, *Intelligence, Surveillance, and Reconnaissance (ISR) Planning, Resources and Operations*, 2 April 2004.

AFI 10-301, *Responsibilities of Air Reserve Component (ARC) Forces*, 16 August 2006.

AFI 10-601, *Capabilities-Based Requirements Development*, 31 July 2006

AFI 11-201, *Flight Information Publications*, 31 March 2009.

AFI 11-230, *Instrument Procedures*, 6 April 2006.

AFI 14-105, *Unit Intelligence Mission and Responsibilities*, 3 June 2002.

AFI 14-111, *Intelligence in Force Modernization*, 10 January 2005.

AFI 14-117, *Air Force Targeting*, 13 May 2009.

AFI 14-201, *Intelligence Production and Applications*, 1 December 2002.

AFI 14-205, CL-1, *Geospatial Information and Services (GI&S) Checklist*, 28 March 2008.

AFI 10-601, *Capabilities Based Requirements Development*, 31 July 2006.

AFI 31-401, *Information Security Program Management*, 1 November 2005.

AFI 31-601, *Industrial Security Program Management*, 29 June 2005.

AFI 32-10112, *Installation Geospatial Information and Services (Installation GI&S)*, 19 October 2007

AFI 63-101, *Acquisition and Sustainment Life Cycle Management*, 17 April 2009

AFMAN 10-401V2, *Planning formats and Guidance*, 1 May 1998.

Air Force/A2CG GI&S Smart Book, January 2006

<https://afkm.wpafb.af.mil/ASPs/CoP/OpenCoP.asp?Filter=OO-IN-AF-11>

Abbreviations and Acronyms

AFKN - Air Force Knowledge Now

AIS - Automated Information System

CIB® - Controlled Image Base

CGS - Common Geopositioning Services

COI - Community of Interest

DAFIF - Digital Aeronautical Flight Information File

DI - Director of Intelligence

DPPDB - Digital Point Positioning Data Base

ECHUM - Electronic Chart Updating Manual

FLIP - Flight Information Publication

FMS - Foreign Military Sales

GEOINT - Geospatial Intelligence

GIO - Geo Integration Office

GI&S - Geospatial Information & Services

GPL-AF - Geospatial Product Library- Air Force

HAE - Height Above Ellipsoid

ISR - Intelligence, Surveillance & Reconnaissance

IT - Information Technology

JMPS - Joint Mission Planning System

MSL - Mean Sea Level

NSG - National System for Geospatial Intelligence

PCO - Primary Contract Officer

PFPS - Portable Flight Planning System

PGM - Precision Guided Munitions

TPFDL - Time Phased Force Deployment Listing

WGS - World Geodetic System

WRS - War Reserve Stock

Terms

Geopositioning - Also known as precise positioning, point mensuration, geolocation.

Geospatial Information & Services - Covers all aspects of Air Force geospatial (formerly known as Mapping, Charting and Geodesy). It excludes imagery intelligence, FLIP, DAFIF and related aeronautical information, Joint Personnel Recovery Activity, and Air Target Materials based programs.

Geospatial Intelligence - The exploitation and analysis of imagery, imagery intelligence and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth.

Addresses

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